The Determinants of Student Effort at Learning ERP: A Cultural Perspective

Khaled A. Alshare
Mazen El-Masri
AIS Department
Qatar University
Doha, Qatar
kalshare@qu.edu.qa, mazen.elmasri@qu.edu.qa

Peggy L. Lane
Steven L. Craig School of Business
Missouri Western State University
St Joseph, MO 64507, USA
plane3@missouriwestern.edu

ABSTRACT

This paper develops a research model based on the Unified Theory of Acceptance and Use of Technology model (UTAUT) and Hofstede's cultural dimensions to explore factors that influence student effort at learning Enterprise Resource Planning (ERP) systems. A Structural Equation Model (SEM) using LISREL was utilized to validate the proposed research model using a convenience sample of students at two universities in the USA. The results showed that while subjective norm and career relevance were positively associated with performance expectancy (PE), course structure and self-efficacy were positively associated with effort expectancy (EE). Performance expectancy and effort expectancy were positively associated with student attitude toward ERP. Student attitude toward ERP was positively associated with student effort at learning ERP. The results also revealed that power distance, uncertainty avoidance, and masculinity moderate the relationships between EE and PE on one side and attitude on the other side, between EE and PE, and between attitude and effort at learning ERP, respectively. Implications for educators and researchers are reported.

Keywords: Enterprise resource planning (ERP), Culture, Technology acceptance model (TAM), Unified theory of acceptance and use of technology model (UTAUT), User acceptance

1. INTRODUCTION

Enterprise Resource Planning (ERP) software is a comprehensive packaged solution that integrates all business processes and functions into one complete information system (Klaus, Rosemann, and Gable, 2000). Today, nearly all Fortune 500 firms have adopted ERP systems to operate their business and improve business strategy execution (Revenaugh and Muretta, 2013). Although the ERP market has matured, the demand for ERP solutions is still growing worldwide. Increasingly, small and medium-sized enterprises (SMEs) are investing in and reaping benefits from ERP systems implementations (Haddara and Zach, 2012). According to the latest Gartner report (Pang et al., 2013), the global ERP software market continues to grow at an annual average rate of 6% and it is expected to reach $34 billion by 2017.

Due to this widespread adoption of ERP systems, there is a high demand by large enterprises (LE) as well as SMEs for graduates with passable ERP experiences (Strong et al., 2006). Indeed, newly hired employees who complete one ERP course are realizing higher salaries than those who do not (Cronan and Douglas, 2012). Hence, it is expected from universities that such specialized knowledge will be embedded in their coursework, more particularly in courses related to information systems (Venkatesh, 2008). This demand for ERP skills is prompting universities to form alliances with ERP vendors. According to SAP, the world's largest ERP vendor, the number of educational institutions they collaborate with continues to increase. Over 1,400 educational institutions in over 80 countries use SAP in their curricula, and over 1.4 million students are practicing SAP (SAP, 2013). Through the SAP university alliance network, professors from around the globe are creating and sharing SAP educational material and exercises.

The results from using ERP systems as a tool to teach students business concepts and provide them with hands-on experiences have been positive. The information systems literature asserts that educators are satisfied with using ERP systems as a teaching method to integrate ERP topics into lectures, exercises, and projects (Leyh, 2012). The relevant literature also shows that students who learn about ERP systems improve their business process knowledge (Cronan and Douglas, 2013), find it useful to their jobs (Garača, 2011), achieve higher salaries (Cronan and Douglas, 2012), and are satisfied with their learning experience (Alshare and Lane, 2011).

Notwithstanding the positive overall impact that ERP learning has on students, educators still find it challenging to make students utilize software packages to their full capabilities knowing that students are driven by the short-term benefits of learning such software (Alshare, 2009). Students are expected to learn and utilize different software packages during their study; however, they may not utilize and exert the effort in learning such software, because they may feel that the software packages are imposed on them (Alshare, 2009). It becomes very important for instructors to understand how they can motivate and encourage their students in exerting effort at learning and utilizing the required software and tools.

The significance of ERP systems in information systems research is reflected in the vast relevant literature. Still, only a small portion is devoted to the integration of ERP systems in education. Moreover, very few articles examine the factors that influence student effort when using ERP systems as learning tools. Those articles examine the impact of factors such as self-efficacy (Shivers-Blackwell and Charles, 2006), teaching methods (Ayyagari, 2011; Seethamraju, 2011; Leyh, 2012), career relevance (Alshare, 2009), and course structure (Alshare and Lane, 2011). Yet, no research has looked at the cultural aspects that could impact students' attitude and effort at learning ERP systems. The use of ERP systems as a learning tool has spread worldwide. According to SAP University Alliance (SAP, 2013), the SAP system is used as a teaching tool at educational institutions in over 80 countries. Students who come from an individualistic or a masculine culture might possess a cultural impact on their attitudes towards ERP systems or their willingness to exert effort to learn about them. Educators might need to alter their teaching approach based on the students' cultures in order to get the most out of the students.

In this paper, we advance existing research on the factors that influence students' effort at learning ERP by assessing the impact of students' cultures. Specifically, we propose a model that integrates Hofstede's (1997) cultural dimensions framework to the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The research questions that we seek to answer are:

RQ1: What are the factors that influence student effort at learning enterprise resource planning systems?

RQ2: Does the impact of such factors vary by culture?

The paper is organized as follows. The next section describes the theoretical frameworks that were adopted. Subsequently, we define the research model and its variables. Next, we explain the adopted methodology. Finally, we report our findings and discuss their implications.

2. LITERATURE REVIEW

2.1 Theories of ERP Acceptance

In the past two decades, the information systems literature thoroughly examined all stages in the ERP lifecycle. According to (Moon, 2007), there were 313 ERP articles published in management journals between 2000 and 2006. While the implementation phase occupied a large chunk of ERP research, ERP usage has also been intensively examined (Addo-Tenkorang and Helo, 2011; Esteves and Bohorquez, 2007). Researchers have adopted a number of theories to understand end-users' acceptance and use of ERP systems. Researchers such as Amoako-Gyampah and Salam (2004), Davis (1989) and Hwang (2005) adopted the Technology Acceptance Model (TAM) as a model to examine end-users' acceptance and use of ERP systems. Other derived models of TAM, TAM2 (Venkatesh and Davis, 2000) and TAM3 (Venkatesh and Bala, 2008), have also been used to explain user acceptance of ERP. The Unified Theory of Acceptance and Use of Technology (UTAUT) has also been a model that was intensively tested in the context of ERP systems (Fillion, Braham, and Ekionea, 2012; Seymour, Makanya, and Berrangé, 2007).

Advancement in user technology acceptance research is primarily attributed to the successful adoption and assessment of models such as TAM, the Theory of Reasoned Action (TRA), UTAUT, and UTAUT2. Although models like TAM explain significant variance in user attitudes and intentions to use, they have been criticized for not incorporating users' personal attributes (Moon and Kim, 2001). This led researchers to integrate factors into the original TAM model such as computer anxiety, peer use (McFarland and Hamilton, 2006), prior usage (Amoako-Gyampah, 2007), trust (Gefen, 2004), shared belief (Amoako-Gyampah and Salam, 2004), and gender (Pasaoglu, 2011; Poon, 2007). The results of such research primarily lead to the conclusion that personal and societal factors play a direct and indirect role in shaping users' attitude and intentions to use information technologies including integrated software packages referred to as ERP systems.

Some researchers combined TAM with other theories to examine user acceptance and use (Hwang, 2005). For instance, Calisir, Gumussoy, and Bayram (2009) combined TAM, theory of reasoned action (TRA) and innovation diffusion theory (IDT) with gender, education level and experience to examine ERP system acceptance. Garača (2011) integrated TAM and Expectation Confirmation Theory (ECT) to investigate the intended use of the ERP system. Kwak et al. (2012) integrated TAM variables with the socio-environmental factor subjective norm as a potential determinant of performance expectancy (PE) and effort expectancy (EE). There were other theories that researchers employed to examine user acceptance and intentions to use ERP systems. These theories include Flow Theory (Choi, Kim, and Kim, 2007) and Innovation Diffusion Theory (Poba-Nzaou, Raymond, and Fabi, 2008).

Although abundant research has been conducted on ERP systems since the mid-90s, interest in the field has declined in the past few years. A literature review conducted by Addo-Tenkorang and Helo (2011) reports that the number of ERP articles was the highest in 2005 at 131 articles and then steadily declined to 13 articles in 2010. This decline was attributed to the maturity of the ERP field (Moon, 2007). Nonetheless, the field also observed an interest in ERP research for small and medium enterprises (SMEs). Indeed, the number of articles published on ERP in SMEs increased from 2 articles in 1999 to 20 articles in 2010 (Haddara and Zach, 2012). The increase in research interest is in line with the ERP vendors' move to focus on the SMEs market instead of the LEs market (Haddara and Zach, 2012). For example, Iris and Cebeci (2014) examine Turkish SMEs and the positive two-way relationship that exists between implementing an ERP system and applying lean principles.

2.2 ERP Acceptance in Education

Adequate ERP skills are in great demand in the market. This demand is primarily attributed to the fact that almost all LEs have already adopted ERP systems and SMEs are increasingly adopting them. Indeed, user education and training is one of the most cited ERP implementation critical success factors (Al-Fawaz, Al-Salti, and Eldabi, 2008). Although integrating ERP learning into university curricula has drastically increased in the past years, investigating this phenomenon did not gain enough attention by the ERP research community. According to Addo-Tenkorang and Helo (2011), this topic forms only 2.4% of the total number of journal articles published between 2005 and 2010. Furthermore, most of those articles principally argue for the need to incorporate ERP into business schools or describe how ERP was or should be integrated into courses and curriculum (e.g., Cannon et al., 2004; Hilletofth, Hilmola, and Ujvari, 2010; Peslak, 2005; Volkoff, 2003; Wang and Hwang, 2011). A few articles – e.g., Cronan and Douglas (2012) and Cronan and Douglas (2013) – evaluated students' increase in knowledge of ERP after playing an ERP simulation game. Yet, some articles went further to examine the factors that affect students' learning of ERP systems. These articles adopted theories from the technology acceptance literature to principally investigate students' attitudes toward, intentions to use, and satisfaction with ERP systems. For instance, Shivers-Blackwell and Charles (2006) examined the impact of students' readiness for change on their attitudes towards ERP and intentions to use it. Specifically, the authors used TAM as the overarching model to evaluate how the students' perceptions of usefulness and ease of use of an ERP system can mediate the impact of students' readiness on their attitudes and use intentions. Alshare and Lane (2011) employed the Unified Theory of Acceptance and Use of Technology model (UTAUT) to examine students' attitudes towards ERP systems and their intentions to use it. The authors included the external variables of hands-on training, perceived instructor knowledge, and course structure as antecedents in the UTAUT model and found they impacted students' attitudes, learning and overall satisfaction.

2.3 ERP Acceptance and Culture

There have been numerous investigations on how culture impacts user acceptance of technology and some recent studies examining the role culture plays on ERP projects. Most of this research finds that culture moderates the relationship between information systems characteristics and user acceptance. For instance, El Sawy (1985) argued that organizations that have a culture that encourages learning and breaks dysfunctional stereotypes of computer use can achieve higher technology acceptance amongst users. His study examined how actively improving the culture of a research academic institution achieved higher technology diffusion.

Zaglago et al. (2013) suggest the cultural impact on ERP adoption and use cannot be ignored. In their study conducted in manufacturing organizations in India, Chockalingam and Ramayah (2013) found that organizational culture, which is often neglected, acts as a moderator between critical success factors and implementation success in ERP projects. Likewise, in a study of Iranian organizations, Dezdar and Ainin (2012) found a significant relationship between organizational culture and ERP implementation success. Garg and Garg (2014) found that the people factor ranked second behind the strategic factor in importance regarding ERP implementation success in the Indian retail section. Elbardan and Ghoneim (2015) propose a framework to offer strategies to internal auditors for enabling adaption of ERP systems to internal and external pressures.

Hasan and Ditsa (1999) adopted Hofstede's (1980) conceptualization of culture to find that risk-averse and individualistic cultures are less ready to adopt new information technologies. They also showed that people from cultures that accentuate managerial power over subordinates are more likely to accept new information technologies than those who do not. Likewise, a study by Agrawal and Haleem (2005) examined user attitudes towards information systems and their intentions to use them in relation to Hofstede's (1980) conceptualization of culture. The authors' study compared the use of different application software in the USA and India. Their results were similar to the results of Hasan and Ditsa (1999). The attitude towards internet usage varied between users in Hong Kong – a collectivist culture – and USA – an individualistic culture (Chau et al. 2002). Alshare et al. (2011) found that national culture dimensions as represented by masculinity, power distance, individualism and uncertainty avoidance, moderate four extended TAM relationships. For example, masculinity positively moderates the relationship between attitude and computer usage.

3. RESEARCH MODEL AND HYPOTHESES FORMULATION

This study examines the factors that influence students' attitudes toward ERP systems and the effort they are willing to exert to learn about them. To this end, it integrates two important theoretical frameworks - The Unified Theory of Acceptance and Use of Technology model (UTAUT) and Hofstede's taxonomy of national culture. The UTAUT model, which was introduced by Venkatesh et al. (2003), has been extensively used by researchers since it was based on

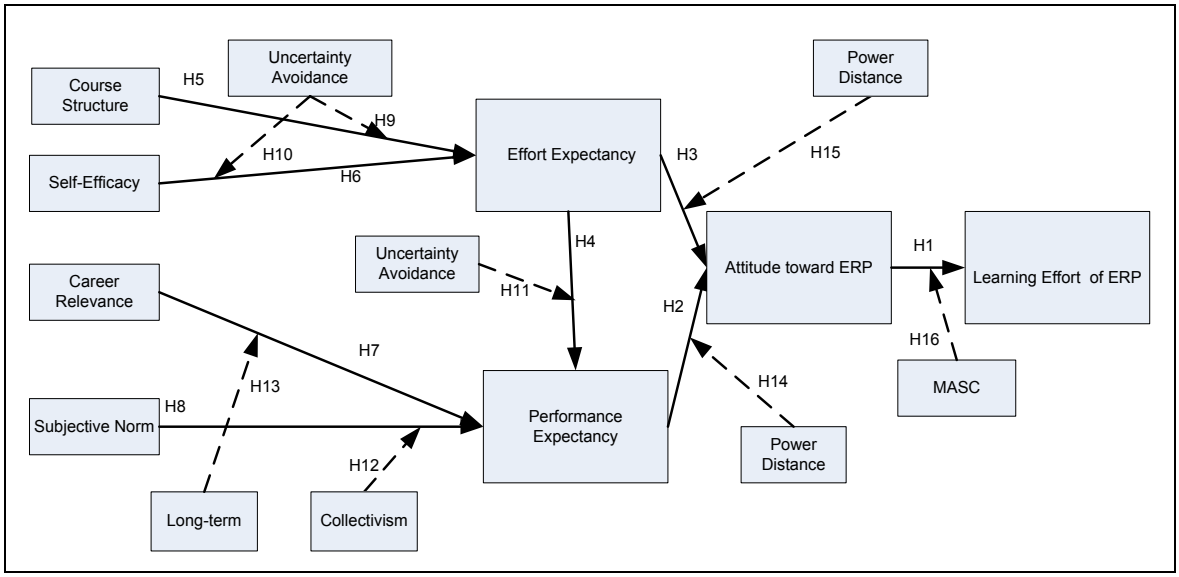

Figure 1. Research model

reviewing and analyzing many prominent theories and models of technology use such as the Theory of Planned Behavior (TPB), the Innovation Diffusion Theory (IDT), TAM, the Theory of Reasoned Action (TRA), and Social Cognitive Theory (SCT). It has been reported by Williams, Rana, and Dwivedi (2015) that the original UTAUT article, Venkatesh et al. (2003), has been cited about 5,000 times. It should be noted that Venkatesh, Thong, and Xu (2012) proposed UTAUT2 that focuses on technology acceptance in the consumer context. The UTAUT2 model included additional factors such as hedonic motivation, price value, and habit. These additional factors are not relevant to this study since students use ERP software as part of their course curriculum and they use it for free. Therefore, the UTAUT was the appropriate model for our study.

The UTAUT model includes four factors that influence user intention and usage of a particular technology. These factors are effort expectancy, performance expectancy, social influence, and facilitating conditions. The proposed model in this study includes three main factors as part of the UTAUT model. These factors are effort expectancy (EE), performance expectancy (PE), and social influence (SI). The "facilitating conditions" factor was not included since the resources and the support needed for the use of ERP system were available for students, and therefore, this factor would not influence students' perception. Additionally, the proposed model included the self-efficacy factor which measures students' perception of their capability of using the ERP system. The original UTAUT model examined the moderating effect of demographic variables (gender, age, experience, and voluntarism). Since the focus of this study was on the impact of cultural values, the demographic variables were not included in this study due to the inclusion of the cultural dimensions as moderators. Additionally, the sample size and the sample profile did not support the inclusion of some of these variables.

On the other hand, Hofstede's cultural taxonomy (1980) is the most popular conceptualization of national culture (Leidner and Kayworth, 2006; Venaik and Brewer, 2008). While all culture models such as the ones introduced by Hall (1976); House et al. (2004); Schein (1990); Triandis and Gelfand (1998); and Trompennaars (1994) are important, Hofstede's definition is the most commonly acceptable definition of culture (Alshare and Musa, 2014; Hofstede 2011; Srite and Karahanna, 2006). It continues to be one of the most cited works related to culture research in the Social Science Citation Index (Alshare et al., 2011). Additionally, Hofstede's culture framework has been internationally recognized as a standard used to distinguish one culture from another (Sundar, 2013).

Hofstede's model was examined thoroughly in information systems literature and forms a strong theoretical foundation (Leidner and Kayworth, 2006). Originally, Hofstede (1980) defined national culture according to the four dimensions of power distance, uncertainty avoidance, individualism–collectivism, and masculinity–femininity. In 1988, Hofstede and Bond (1988) included time orientation as the fifth cultural dimension. As suggested by Venkatesh et al. (2003), this study also integrated external variables in our model. The external variables included are course structure, self-efficacy, career relevance, and subjective norms. The research model depicted in Figure 1 is proposed. The hypotheses follow the model.

3.1 UTAUT Variables

The UTAUT model asserts that users' perceptions of usefulness (performance expectancy) and ease of use (effort expectancy) of an information system, social influence, and facilitating conditions influence their intentions and their subsequent usage behavior. In mandatory settings where use is required (e.g., class-related technology), Brown et al. (2002) argue that users' attitudes replace intentions. Indeed, previous studies have shown that attitude correlates strongly with usage behavior when examined in mandatory environments (Brown et al., 2002; Yousafzai, Foxall, and Pallister, 2007a; Yousafzai, Foxall, and Pallister, 2007b). In classroom settings, usage behavior corresponds to the effort

that students exert at learning a particular type of ERP systems. Accordingly, we hypothesize that students' attitude is the main factor that influences their effort at learning ERP:

H_1: A positive attitude (AT) toward ERP software has a significant impact on student effort (EF) at learning ERP software.

Students' perceptions of effort expectancy (EE) and the performance expectancy (PE) of a certain information system can explain their attitudes. Moreover, EE positively influences the way students perceive its usefulness (PE). Hence the following hypotheses are proposed:

H_2: Students' perceived performance expectancy (PE) has a positive impact on their attitudes (AT) toward the ERP software.

H_3: Students' perceived effort expectancy (EE) has a positive impact on their attitudes (AT) toward the ERP software.

H_4: Students' perceived effort expectancy (EE) has a positive impact on their perceived performance expectancy (PE) of ERP software.

3.2 External Variables

In his original model, Davis (1989) suggested that the model could be extended by exploring other external variables that might affect ease of use, usefulness, and user intention and usage. Indeed, models like TAM2 by Venkatesh and Davis (2000), TAM3 by Venkatesh and Bala (2008), UTAUT by Venkatesh et al. (2003), UTAUT2 by Venkatesh, Thong, and Xu (2012), and others extended the original TAM model to include external variables. Our study incorporates the external variables of course structure, self-efficacy, career relevance, and subjective norm. These variables have been included and assessed, albeit not concurrently, as independent variables in prior research; for example, see Alshare and Lane (2011); Venkatesh, Thong, and Xu (2012); Venkatesh and Bala (2008); Venkatesh and Davis (2000).

Course structure is defined by the clarity and organization of the course objectives and materials (Eom, Wen, and Ashill, 2006). Prior research asserts that the adequacy of the ERP course's design and content positively impacts students' perception of the ease of use of ERP systems (Alshare and Lane, 2011). Accordingly, the following hypothesis is proposed:

H_5: Students' perception of the course structure (design and content) (CS) has a positive impact on their perceptions of effort expectancy (EE) of the ERP software.

Self-efficacy is an individual's belief in his/her capability of performing a particular task (Roca, Chiu, and Martinez, 2006). The concept of self-efficacy originated from the social cognitive theory. It has been previously observed as an antecedent of users' acceptance of technology and was found to have an impact on user attitude (e.g., Shivers-Blackwell and Charles, 2006; Shih and Fang, 2004; Venkatesh et al., 2003). Consistent with that of Venkatesh et al. (2003), self-efficacy was defined in terms of the assessment of individual ability to apply computer skills that pertain to ERP tasks. We posit that students' perceived judgments of their own capabilities to perform ERP activities will influence their perception of the ERP software ease of use (EE). Hence, we propose the following:

H_6: Students' Self-Efficacy (SE) has a positive impact on their perceptions of the effort expectancy (EE) of the ERP software.

Career relevance is defined by Venkatesh and Davis (2000) as the employee perception regarding the degree to which the target system is applicable to his/her career. In our case, career relevance denotes the students' perceptions regarding the relevance of the ERP course to their career and program of study. In four longitudinal field studies that examined factors that influence employees' use and adoption of information systems, Venkatesh and Bala (2008) found that perceptions of career relevance positively correlates to perceptions of system usefulness. In the context of ERP use in education, we argue that students' perceptions of relevance of learning ERP for their education and careers will also influence their perceptions of ERP usefulness. Thus, the following hypothesis is proposed:

H_7: Students' perception of the relevance of ERP software to their career (CR) has a positive impact on their perceptions of performance expectancy (PE).

Subjective norm is defined as the perceived social pressure to perform or not to perform a particular behavior (Ajzen, 1991). Prior studies have shown that subjective norm is a predictor for behaviors in various contexts (Brown et al., 2002; Shih and Fang, 2004; Venkatesh, Thong, and Xu, 2012). As reported by Venkatesh and Davis (2000), people have the tendency to incorporate the societal beliefs regarding the use of a certain information system into their own belief structure. Venkatesh and Davis (2000) found a positive relationship between social norms towards information systems and the perception of their usefulness. In our study, subjective norm includes the social pressure from classmates and other close members to the students. It is expected that students feel pressured to learn and utilize ERP software. Therefore the following hypothesis is proposed:

H_8: Students' perception of the subjective norms (SN) pertaining to ERP software has a positive impact on their perception of performance expectancy (PE).

3.3 The Moderating Effects of Cultural Variables

Hofstede's cross-cultural taxonomy describes the effects of a society's culture on the values of its members and how these values can affect their behaviors (1980). According, to Hofstede (1980, 1997) and Hofstede and Bond (1988), cultures are comparable on five dimensions that are common to all countries. These dimensions are uncertainty avoidance, individualism/collectivism, long-term orientation, power distance, and masculinity/femininity.

Uncertainty avoidance (UA) is the degree to which the members of a culture feel uncomfortable or threatened when faced with situations that are ambiguous or unknown (Hofstede, 1980). People from high uncertainty avoidance cultures have a higher tendency to avoid unclear and unstructured situations by establishing rules that help them reject irregular ideas and behaviors (McCoy, Galletta, and

King, 2007). Indeed, a study by Thatcher et al. (2003) showed that students who manifest high uncertainty avoidance find it uncomfortable to experiment with new software. In our proposed model, the structure of the ERP course and the students' judgment of their own skills to experiment with new software (self-efficacy) are seen as the main components of uncertain situations that influence their perceptions of the ease of use of ERP systems. Therefore, we postulate that uncertainty avoidance (UA) moderates the effects of course structure (CS) and self-efficacy (SE) on the perceived effort expectancy (EE) of ERP software. Likewise, uncertainty avoidance (UA) is hypothesized to moderate the effect of effort expectancy (EE) on perceived performance expectancy (PE). The related hypotheses are:

H_9: Uncertainty avoidance (UA) moderates the effect of course structure (CS) on students' perceptions of effort expectancy (EE) of the ERP software.

H_{10}: Uncertainty avoidance (UA) moderates the effect of students' self-efficacy (SE) on students' perceptions of effort expectancy (EE) of the ERP software.

H_{11}: Uncertainty avoidance (UA) moderates the effect of students' perceptions of effort expectancy (EE) on their perceptions of performance expectancy (PE) of the ERP software.

Individualism (IDV) is the degree to which people of a culture prefer to act alone as individuals rather than as collective members of groups (collectivism) (Hofstede 1980). Individualists think for and take care of themselves whereas collectivists expect that the groups they belong to will guide and support them in exchange for loyalty (Leidner and Kayworth, 2006). People belonging to collective cultures make decisions that are more in harmony than their counterparts which makes them more likely to adopt new software (Mejias et al., 1996). On the other hand, people from individualistic cultures might perceive software like ERP as expendable and refrain from learning it notwithstanding any social or peer pressure to do so. The opposite is true as well. The impact of social pressure on the perception of usefulness of ERP software is expected to increase in situations where the person comes from a collectivist culture. Therefore, we expect that the degree of collectivism/individualism of a culture to moderate the effect of social norms on students' perceived performance expectancy (PE) of the ERP software. Accordingly, the following hypothesis is proposed:

H_{12}: Collectivism (COLV) moderates the effect of social norms (SN) on students' perceived performance expectancy (PE) of the ERP software.

Time orientation (TO) is related to a culture's orientation to the future. It is the degree to which people are willing to sacrifice now for long term benefit (long-term orientation) or be more focused on short-term results (short-term orientation) (Hofstede and Bond, 1988). The more long-term oriented a culture is, the more its people are persistent and thrifty toward slow results (Hofstede and Bond, 1988). Thus, we believe that time orientation will moderate the relationship between the degree to which students' careers are relevant to them and the perceived usefulness of the ERP software. Specifically, we expect that the relevance of ERP software to students' careers will correlate strongly with their perceptions of its usefulness especially for those with a long-term orientation.

H_{13}: Time orientation (TO) moderates the effect of career relevance (CR) on students' perceived performance expectancy (PE) of the ERP software.

Power distance (PD) is the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally (Hofstede, 1980). Status differences among people tend to be very pronounced in high power distance cultures, while low power distance cultures have a more egalitarian philosophy when making decisions (Tan, Watson, and Wei, 1995). According to Straub, Keil, and Brenner (1997), the larger the power distance of a culture, the more likely people from that culture will accept and use new information technology. More importantly, users of high power distance cultures are more likely to form positive attitudes toward certain software and use it irrespective of the ease of use or usefulness of the software than people of low power distance cultures (McCoy, Galletta, and King, 2007). For example, if instructors who teach ERP have a positive attitude toward ERP systems, they will positively influence students' attitude toward ERP systems. The premise is that in high power distance cultures, people are more reluctant to disagree with their superiors than their counterparts. Hence, we propose the two following hypotheses:

H_{14}: Power distance (PD) moderates the effect of students' perception of performance expectancy (PE) on their attitude (AT).

H_{15}: Power distance (PD) moderates the effect of students' perception of effort expectancy (EE) on their attitude (AT).

Masculinity (MASC) refers to the degree to which a culture values assertiveness, achievement, and material success, while, femininity values principles such as nurturing, caring, and a focus on quality of life (Hofstede, 1980). People who manifest a high level of masculinity have been found to be more willing to use a technology that they deem technically sound than their counterparts (Hasan and Ditsa, 1999). Hence, the degree of masculinity a person's culture entrenches is posited to moderate the effect of their attitude toward ERP and the amount of effort they are willing to exert in order to learn it. Accordingly, the following hypothesis is proposed:

H_{16}: Masculinity (MASC) moderates the effect of students' attitude (AT) toward ERP software on their effort (EF) to learn it.

4. RESEARCH METHOD

4.1 Survey Questionnaire

In order to evaluate the model proposed in Figure 1, we conducted an empirical study at two universities in the Unites States using the survey method. The survey questionnaire consisted of two sections. The first section requested various types of demographic information, including gender, classification, and discipline, among other

Construct /Items	Loadings													Corrected item-total correlations
	EF	AT	PU	PEOU	CS	SE	CR	SN	PD	UA	CO	MA	LT	
EF1	0.80													0.540
EF2	0.71													0.540
AT4		0.90												0.863
AT3		0.94												0.901
AT2		0.85												0.791
PE2			0.93											0.854
PE1			0.92											0.859
PE3			0.78											0.735
EE2				0.75										0.779
EE4				0.91										0.672
CS1					0.82									0.761
CS2					0.90									0.809
CS3					0.84									0.767
SE4						0.93								0.759
SE5						0.82								0.759
CR2							0.85							0.771
CR5							0.91							0.858
CR6							0.92							0.881
SN1								0.92						0.880
SN2								0.97						0.929
SN4								0.89						0.861
PD1									0.75					0.480
PD5									0.76					0.555
PD6									0.85					0.647
UA1										0.85				0.707
UA2										0.79				0.617
UA3										0.84				0.674
CO4											0.84			0.538
CO5											0.84			0.538
MA3												0.82		0.567
MA4												0.86		0.567
LT5													0.79	0.420
LT8													0.77	0.420
Cronbach Alpha	0.70	0.92	0.91	0.84	0.89	0.86	0.92	0.95	0.73	0.81	0.70	0.70	0.65	

Table 1: Reliability and validity

variables. The second section included the items required to evaluate the 13 variables of the proposed model described earlier. Only one of these variables – effort to learn ERP – was developed by the authors. The remaining variables were derived from the extant literature and modified to fit the context of our study. Attitude, perceived usefulness, perceived ease of use, social norms, career relevance, and self-efficacy were adapted and modified from Venkatesh et al. (2003). The course structure variable was adapted and modified from Eom, Wen, and Ashill (2006). The cultural dimensions were adapted and modified from Hofstede (1997). The survey questionnaire statements were based on a seven-point Likert scale, which ranged from strongly disagree (1) to strongly agree (7) as shown in the Appendix.

4.2 Data Collection

The survey questionnaire was completed by students who were enrolled in three different but similar ERP courses at two Midwestern US universities. The two instructors had team taught together previously. They used similar teaching

	N	Chi^2	df	RMSEA	NFI	CFI	NNFI
Measurement Model	*102*	*53.75*	*38*	*0.064*	*0.95*	*0.98*	*0.98*
Structural Model	*102*	*294.94*	*190*	*0.074*	*0.94*	*0.98*	*0.97*

Table 2: SEM fit

materials and instructions in their courses. The survey was distributed to the students during the last week of class. To ensure anonymity, students returned the surveys to one of the coauthors who did not teach the classes. All 102 students from the three courses completed the survey. Two-thirds of the students were males. Approximately 63% of the respondents were from USA and the rest were from different nationalities. Most of the students (73%) were MBA students. However, only a few of them (19%) had previously used an ERP system and very few (4%) had previously taken an ERP course.

4.3 Data Analysis

The collected data was analyzed in three stages. In the first stage SPSS was used to compute frequencies, means, standard deviation, reliability coefficients, and principal component analysis. In the second stage the factor loadings that were computed in the principal component analysis were validated by conducting a confirmatory factor analysis using LISREL. In the third stage LISREL was used to evaluate the overall structural equation model and its associated hypotheses.

Items with loadings of 0.7 and above were retained. The items that did not load well were removed as shown in the Appendix. All of the eight main constructs in our model demonstrated high reliability with acceptable Cronbach's Alpha. Seven out of eight constructs had a Cronbach's Alpha value of 0.84 or higher. With respect to the cultural dimensions, their Cronbach's Alpha values were 0.7 or above with the exception of the long-term dimension (α = 0.65). Table 1 provides more details on the constructs' factor loadings.

The guidelines provided by Comrey and Lee (2013) were used to evaluate factor loadings. Four fit indices were used to assess the goodness of fit for both the measurement and structural models. The first three indices, the Normed Fit index (NFI), Non-Normed Fit Index (NNFI), and Comparative Fit Index (CFI), were expected to exceed .9 to indicate good fit. The fourth index, the Root Mean Square Error of Approximation (RMSEA), should be less than 0.08 (Hu and Bentler, 1999). For the models to be accepted, at least three of the four fit indices should meet these standards. As shown in Table 2, all four of the fit indices for both measurement and structural models met the standards mentioned above. Additionally, the univariate normality was evaluated using the values of the Skewness and Kurtosis for all indicator variables. The ranges of the values for Skewness and Kurtosis were (-0.325 to 0.118) and (-0.992 to 0.948), respectively. These values do not indicate a problem with the normality assumption since they are within the range of (-1 to 1) (Hair et al., 2006). Additionally, examining the Q-Q plots did not show any concern with respect to deviating from normality.

5. RESULTS

Results of the study are presented in two sections. The first section provides the results for the basic model which includes hypotheses H1-H8. The second section reports the results of the moderating effect of culture dimensions which includes hypotheses H9-H16. Consistent with prior empirical studies, hypotheses H1-H8 were supported and achieved a significance level of 0.05 or less. The standardized path coefficients and the significance levels for the hypotheses are reported in Figure 2. Results reveal that the strongest predictor of performance expectancy is career relevance (H7) supporting the findings of Venkatesh and Davis (2000) pertaining to this relationship. This suggests that one of the utmost aspects that is important to students when evaluating the usefulness of learning ERP software is dependent on the latter's relevance to their career and program of study. On the other hand, the relationship between subjective norm and performance expectancy (H8) is less significant. Students seem to reflect wisely on what matters most to their education and careers and make decisions accordingly without depending too much on peer opinions and societal pressures.

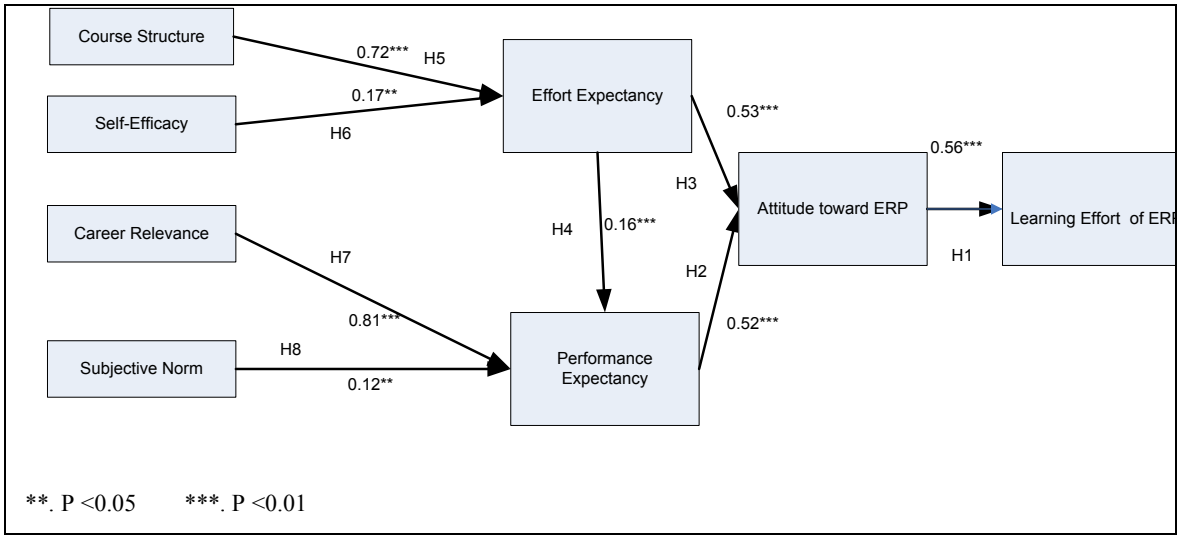

Figure 2: Model 1 results

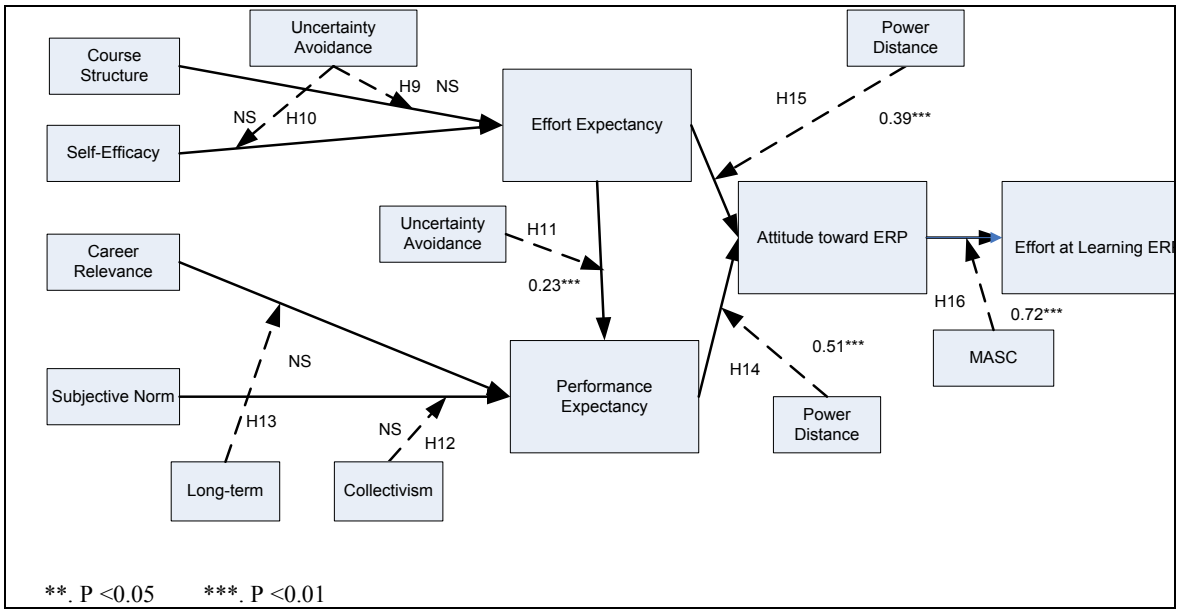

Figure 3: Model 2 results

Pertaining to students' perceptions of the effort expectancy of ERP software, the strongest predictor is found to be the structure of the ERP course (H5) which provides further support for the results of Alshare and Lane's study (2011). Students' beliefs in their abilities to learn ERP was also found to influence their perceptions of ERP software effort expectancy (H6). Nonetheless, the strength of the latter relationship is less significant. The findings imply that students rely more heavily on the instructors' competencies in designing a well-structured learning environment when they assess ERP software's ease of use than on their own capabilities. The hypotheses depicting the relationships between the variables in the UTAUT model (H1, H2, H3, and H4) are all supported. All four relationships were significant at a level less than 0.01 demonstrating the adequacy of the model in predicting information systems level of use.

With respect to the moderating effect of the cultural attributes, four hypotheses (H11, H14, H15, and H16) were supported and significant as shown in Figure 3. Uncertainty avoidance was found to moderate the effect of perceived effort expectancy on performance expectancy (H11). In other words, the perceived ease of use of the ERP software has a stronger impact on its perceived usefulness for students who come from cultures that avoid uncomfortable and ambiguous situations. This is consistent with the assertion of McCoy, Galletta, and King (2007).

Another cultural attribute that plays an important role in our model is power distance which represents the degree of inequality between people of a certain culture that is considered normal (Hofstede, 1980). Consistent with our theorization, power distance moderates the relationship between perceived effort expectancy and performance expectancy on one side and attitude towards ERP on the other side (H14 and H15). Specifically, the degree to which the attitude that students form toward ERP software is affected by their perceptions of usefulness and effort of using such software depends on their reluctance to disagree with the authority (the instructor). The third and final cultural attribute that contributed to our model is masculinity/ femininity. Our results show that the relationship between students' attitudes towards ERP and the amount of effort they are willing to exert to learn it is moderated by the cultural emphasis on goals like earnings, promotions, and assertiveness. We interpret this to mean that the students of masculine cultures, compared to those from feminine cultures, will exert more effort to learn ERP software based on their attitudes.

6. DISCUSSION

Results show that students' perceptions of effort expectancy (software ease of use) and performance expectancy (usefulness) of ERP software significantly predict students' attitudes which in turn significantly impact the level of student's effort at learning ERP software. Perhaps more importantly this study gives evidence that the UTAUT model stands strong as a theoretical lens to examine the use of ERP software in education. In order to increase students' efforts and thereby maximize ERP learning, educators who use ERP software in class must ensure that students' attitudes are positive toward ERP by highlighting its usefulness and facilitating instructional efforts.

One of the most important determinants of users' perceptions of effort expectancy has been users' self-efficacy leading us to evaluate its impact in our model. Notwithstanding the positive relationship between student self-efficacy and perceived effort expectancy that we found, course structure – a construct that was designed specifically for the learning context by Eom, Wen, and Ashill (2006) – has a much higher impact. We interpret this as a tendency of students, contrary to users in organizations, to rely more on the guidance and practice offered by the course than their own knowledge and skills. Students need to trust that the

Cultures with high Masculinity, high Power Distance, and high Uncertainty Avoidance		
Creating Positive Attitude	**Emphasizing Performance Expectancy**	**Emphasizing Effort Expectancy**
More emphasis on creating positive attitude is needed by: • Making learning ERP more fun and interesting • Emphasizing the usefulness of ERP system • Minimizing the difficulty of learning ERP system	More emphasis on the usefulness of learning ERP is needed by: • Highlighting benefits of learning ERP while studying • Highlighting benefits for future career • Emphasizing the relationship between the use of ERP and productivity	More emphasis on the ease of use of ERP is needed by: • Preparing well-structured instructions on how to use ERP system • Ensuring the availability of help in the lab • Providing more hands-on activities

Table 3: Directives to increase effort at learning ERP by cultural dimensions

course is organized and includes sufficient hands-on opportunities to make the ERP software easy to understand. On the other hand, users of software in organizations are more proactive learners who rely on their own past experiences. Pertaining to the antecedents of perceived software usefulness, past studies have shown that the subjective norms construct is the most prominent (Venkatesh, Thong, and Xu, 2012; Venkatesh and Bala, 2008; Shih and Fang, 2004). Yet in the context of ERP learning in the academy, the subjective norms construct plays a marginal role when compared with career relevance. Indeed, our study shows that students' career relevance can explain performance expectancy of learning ERP software. These findings are encouraging as they imply that students will view the usefulness of software they learn with its importance to their programs of study and careers and will exert the amount of effort to learn it proportionally. Students value success in education and careers more than they do peer and societal influence. The latter seem to have a more significant impact on users in an organizational context, as it was shown in Venkatesh and Bala (2008), than on students in the academic environment.

We found that three of the five cultural dimensions of Hofstede's model (1997) bear significant moderating impacts on the relationships among the main variables in our model. Educators should be more attentive to the degree of masculinity, power distance, and uncertainty avoidance that students' cultures manifest. Indeed, the original relationships between the variables of the UTAUT model are more unequivocal for cultures that ran high on masculinity, power distance and uncertainty avoidance. For example, students' attitudes have stronger effects on their efforts at learning ERP software for those who are from masculine cultures (e.g., USA and Greece; http://geert-hofstede.com/countries.html) compared to students from feminine cultures (e.g., Chile; http://geert-hofstede.com/countries.html). The way students perceived ERP usefulness and ease of use has stronger effects on their attitudes if they come from high power distance cultures (e.g., China and Arab countries; http://geert-hofstede.com/countries.html) compared to their counterparts from low power distance cultures (e.g., USA and Germany; http://geert-hofstede.com/countries.html). Additionally, their perceptions of effort expectancy of ERP has a stronger effect on their perceptions of performance expectancy of ERP if they come from high uncertainty avoidance cultures (e.g., Latin countries, Japan, and Arab countries; http://geert-hofstede.com/countries.html) in contrast to those from low uncertainty avoidance cultures (e.g., USA and Netherlands; http://geert-hofstede.com/countries.html).

The implication from the above findings is that instructors who teach in countries with high masculinity, high power distance, and high uncertainty avoidance need to remember the strong impact of attitude, performance expectancy, and effort expectancy on student's effort at learning ERP software in such countries. Thus, more emphasis on creating positive attitudes is needed which could be accomplished by making learning ERP more fun and interesting. This in turn will have a more positive impact on the students' effort at learning ERP software. By the same token, instructors need to emphasize the ease of use and the usefulness of ERP systems by, for example, communicating the short and long term benefits from learning about ERP software, providing clear instructions on how to use the system, offering lab sessions, and providing online helpdesk assistance. Table 3 provides recommended actions.

Our results also indicate that the impact of course structure and self-efficacy on perceived effort expectancy does not vary by culture, nor does the impact of career relevance and subjective norms on perceived performance expectancy. Regardless of students' cultures, the course structure and career relevance are key factors that influence students' perceptions of effort expectancy and performance expectancy of ERP systems respectively. Students' self-efficacy and subjective norms are also important factors albeit to a lesser extent. Table 4 provides instructors with actions that could be employed to improve overall student attitude toward ERP systems.

Instructors may improve student knowledge about ERP systems by developing attractive materials related to ERP. They can design clear course objectives and expectations and deliver course materials in ways that are easy for students to understand. Organizing the course materials in a smooth and logical manner will influence students' perceptions regarding the ease of use of the ERP systems. Moreover, instructors need to build the students' confidence in their ability to comprehend and apply the concepts they learned through emphasizing the hands-on exercises. Needless to say, students' perceptions of the usefulness of ERP systems are affected by their classmates' attitudes. Thus, it is worthwhile to invite seniors or recent graduates to the class to discuss with students the career relevancy and the benefits of ERP systems. To increase student's self-efficacy, instructors can integrate hands-on training sessions into the course structure and assign a lab assistant to help students better understand

Increase Learning Efforts by Creating Positive Attitudes			
Improve Perceived Effort Expectancy		**Improve Perceived Performance Expectancy**	
Provide Well-Structured Course Design	**Increase Self-Efficacy**	**Emphasize the Subjective Norm**	**Highlight Career Relevance**
• Clarify course objectives • Share and align expectations • Organize course material into logical and understandable components	• Develop high quality course material • Integrate hands-on training sessions • Hire assistant in lab • Increase lab assignments	• Invite senior students and graduates to talk about the benefits of ERP • Share information about other academic institutions' use of ERP • Create an atmosphere of shared learning	• Invite professionals to talk about ERP use in industry • Highlight success stories of professionals who use ERP to their advantage • Share existing statistics on the use of ERP in industry

Table 4: Directives to Create Positive Attitude

the covered concepts. As our study finds, students are career driven and will put forth effort to learn ERP software if they believe it will help them succeed. To highlight the significance of ERP software learning to students, instructors can invite professionals to talk about ERP use in industry, share success stories of professionals who use ERP to their advantage, share the abundant statistics on the degree of use of ERP in the industry, and invite professionals to the classrooms to talk about career opportunities in the field.

7. LIMITATIONS AND FUTURE RESEARCH

Before discussing the limitations of the study, we should acknowledge that a large number of academics have concerns about the application of both the UTAUT model and Hofstede's cultural dimensions framework. These concerns are reported in Venkatesh, Thong, and Xu (2012) and Venaik and Brewer (2008). While these concerns are acknowledged, we used the current approach for the following reasons: 1) UTAUT was developed based on analyzing many prominent theories in technology adoption stream of research; 2) It has been intensively used and cited by researchers; 3) UTAUT was a better fit to the current study than UTAUT2 since the latter focuses on technology acceptance from the consumers' perspective; 4) Hofstede's cultural taxonomy is the most popular conceptualization of national culture; 5) Hofstede's definition is the most commonly accepted definition of culture; 6) It continues to be one of the most cited works related to culture research in the Social Science Citation Index; 7) Hofstede's culture framework has been internationally recognized as a standard used to distinguish one culture from another; and 8) The vast majority of international business textbooks use Hofstede's culture framework to measure and examine the importance of cultural differences (Venaik and Brewer, 2008).

There are two main limitations that characterize our study. First, the relatively small sample sizes; however, the sample size met the minimum requirement for this type of analysis (Bollen, 1989; Diamantopoulos and Siguaw, 2007). The second one is the use of self-reported information to measure the study variables which raises the possibility of common method variance concern. To test for that, the Harman's single factor test was employed and it was found that only 34% of variance was accounted for by one factor which is less than the threshold value of 50% (Chandra et al., 2011; Podsakoff et al., 2003). This result suggests that common method variance is not of a great concern and thus, is unlikely to confound the interpretation of the results for this study. The findings of the study provide some opportunities for future studies including developing an instrument that incorporates more factors that impact student's effort at learning ERP such as knowledge about ERP, experience, course level, and measuring actual effort. Another plausible future research path is to analyze the impact of demographic variables (gender, major, discipline, student classification, learning style, and teaching style) on students' efforts at learning ERP software. Finally, future research could address developing a systematic approach to evaluate the moderating effect of the cultural dimensions on all hypothesized relationships.

8. CONCLUSION

ERP software such as SAP has become a critical component of business and technology school curricula with over 1400 educational institutions using SAP as a tool to educate future generations. As the adoption of ERP software in business continues to grow in small and medium enterprises as well as in large businesses, we argue that information systems academics should pay more attention to the factors that can bolster students' efforts to learn it. Our study has shown that applying the UTAUT model provides good theoretical underpinnings to examine student effort to learn ERP software. Indeed, the results replicated findings from the previous examinations found in the information systems literature. We followed suggestions of researchers who have adopted UTAUT in their studies and included additional antecedent factors. This allowed us to distinguish course structure and career relevance and to a lesser extent subjective norms and self-efficacy as the main factors that influence students' perception of effort expectancy and performance expectancy. More importantly and directly related to the study objectives, we found that the cultural dimensions uncertainty avoidance, masculinity/femininity, and power distance play an important moderating role in explaining students' efforts to learn ERP. In the global world of today, as classrooms continue to become more diverse due to increasing numbers of International Students and Study Abroad programs, these findings are particularly useful to the success of all students.

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AUTHOR BIOGRAPHIES

Khaled A. Alshare is a Professor of Information Systems at Qatar University. He received his PhD from the University of Texas at Arlington. His teaching interests include database systems, systems analysis and design, strategic MIS and project management. His research interests include technology acceptance models, behavioral information security, cross-cultural studies in information systems, distance education and data envelopment analysis. His work appeared in various academic journals. He has served in numerous professional organizations such as the DSI (session chair, reviewer), SWDSI (council member, track chair, session chair, discussant and reviewer), AMCIS (minitrack chair, session chair and reviewer) and The Consortium for Computing Sciences in Colleges (board member, papers chair and treasurer).

Mazen El-Masri is an Assistant Professor of Information Systems in the Department of Accounting and Information Systems of the College of Business and Economics at Qatar University. He obtained his Ph.D. in MIS from HEC Montréal, Canada. His work appears in IT & People, JISE, ICIS, AMCIS, ECIS, PACIS, and ASAC. His research includes E-learning, Gamification, Predictive Modeling, IT Project Risk, Big-Data, Social Networks, and Semantics.

Peggy L. Lane is a Professor of Management Information Systems and Director of the Master of Information Management – Enterprise Resource Planning concentration at Missouri Western State University in St. Joseph, Missouri USA. She received her Ph.D. from the University of Arkansas. Her current research interests include pedagogical issues related to ERP, ERP implementation, e-learning, and ethics. Her publications have appeared in various journals including the Decision Sciences Journal of Innovative Education, Communications of the Association for Information Systems, The Journal of Computer Information Systems, and Communications of the ACM. She is an active member of Southwest Region Decision Sciences Institute.

APPENDICES

Appendix 1: List of Scale Items

Construct	Item	Description	Mean	Std.
Effort α = 0.70	EF1	I think that I exerted the maximum effort possible in learning ERP systems	4.72	1.32
	EF2	**If I had the chance to take the course over, I would put the same effort into learning the ERP system**	4.73	1.69
	EF3	**I could not put more time into learning the ERP system than what I did**	3.90	1.72
	EF4	I spent just enough effort in learning ERP systems to get by (rev.)	3.72	1.59
Attitude α = 0.92	**AT1**	**Using the ERP system is a good idea**	5.48	1.36
	AT2	The ERP system makes studying the ERP course more interesting	5.16	1.61
	AT3	Studying the ERP system is fun	4.19	1.96
	AT4	I like learning about the ERP system	4.55	2.97
Effort Expectancy α = 0.84	**EE1**	**Learning to use the ERP system was easy for me**	4.12	1.45
	EE2	I find the ERP system easy to use	3.62	1.49
	EE3	**It would be easy for me to become skillful at using the ERP system**	4.73	1.36
	EE4	My interaction with the ERP system has been clear and understandable	4.51	1.40
Performance Expectancy α = 0.91	PE1	Understanding the ERP system will be useful in my degree program	4.66	1.83
	PE2	Understanding the ERP system will be useful in my job	4.89	1.86
	PE3	**Using the ERP system enables me to accomplish tasks more quickly**	4.53	1.73
	PE4	Using the ERP system increases my productivity	4.68	1.69
	PE5	**If I know how to use the ERP system, I will increase my chances of getting a raise if I have a job**	5.05	1.55
Subjective Norm α = 0.95	SN1	People whose opinion I value would like me to learn about and use the ERP software	4.44	1.49
	SN2	People who are important to me think that I should learn and use the ERP software	4.29	1.48
	SN3	**Most of my classmates encourage me to learn and use the ERP software**	3.75	1.53
	SN4	People who influence my behavior think I should learn and use the ERP software	4.11	1.52
Power Distance α = 0.73	PD1	Managers should make most decisions without consulting others	2.52	1.41
	PD2	**At work, I would conform to my manager's wishes**	4.61	1.29
	PD3	**I believe that those managers who ask opinions too often of subordinates are weak or incompetent**	2.95	1.44
	PD4	**At work, I would tend to avoid any potential arguments with my managers**	4.25	1.58
	PD5	I would be afraid to disagree with my managers	3.12	1.40
	PD6	Employees should not question their manager's decisions	2.63	1.31
Uncertainty Avoidance α = 0.81	UA1	I like to work in a well-defined job where the requirements are clear	5.09	1.35
	UA2	It is important for me to work for a company that provides high employment stability	5.61	1.32
	UA3	Clear and detailed rules / regulations are needed so employees know what is expected of them	5.37	1.17
	UA4	**If I am uncertain about the responsibilities of a job, I get very anxious**	4.45	1.31
	UA5	**In a situation in which other peers evaluate me, I feel that clear and explicit guidelines should be used**	5.31	1.08
Collectivism α = 0.70	**CO1**	**It is better to work in a group than as individuals**	4.57	1.34
	CO2	**I prefer to be responsible for my own decisions**	2.18	0.84
	CO3	**Contributing to the group is the most important aspect of work**	5.22	1.11
	CO4	Group success is more important than individual success	5.16	1.24
	CO5	Individual rewards are not as important as group welfare	4.29	1.57

Masculinity α = 0.70	**MA1**	**It is important to help others on the job**	5.87	0.87
	MA2	**It is important for me to have a job that provides an opportunity for advancement**	6.36	0.79
	MA3	It is important for me to work in a prestigious and successful organization	5.42	1.39
	MA4	It is important for me to have a job that has an opportunity for high earnings	5.88	0.98
	MA5	**It is important that I outperform my coworkers**	5.14	1.09
	MA6	**It is important for me to work with coworkers who cooperate well with one another**	6.01	0.82
Long-Term α = 0.65	LT5	Personal stability is not critical to success in business	3.09	1.49
	LT6	**Respect for tradition hampers performance**	3.98	1.25
	LT7	**The exchange of favors and gifts is not necessary to excel**	4.64	1.39
	LT8	Upholding one's personal image makes little difference in goal achievement	3.58	1.62
Self-Efficacy α = 0.86		I could complete an assignment or task using the ERP software:		
	SE1	**If there was no one around to tell me what to do as I go**	4.10	1.70
	SE2	**If I could call someone for help if I got stuck**	5.26	1.31
	SE3	**If I had just the built-in help facility for assistance**	4.89	1.42
	SE4	If someone showed me how to do it first	5.88	1.10
	SE5	If someone else had helped me get started	5.62	1.17
	SE6	**If I had a lot of time to complete the assignment for which the software was provided**	5.58	1.18
Career Relevance α = 0.92	CR2	Understanding an ERP system will advance my career	5.11	1.56
	CR5	In my job (my career), usage of the ERP system is important	4.42	1.81
	CR6	In my job (my career), usage of the ERP system is relevant	4.66	1.66
Course Structure α = 0.89	CS1	The course objectives and procedures of the course were clearly communicated	5.57	1.29
	CS2	The course material was organized into logical and understandable components	5.29	1.41
	CS3	The expectations from the course were clearly stated	5.41	1.23

* Items in Bold were removed.

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